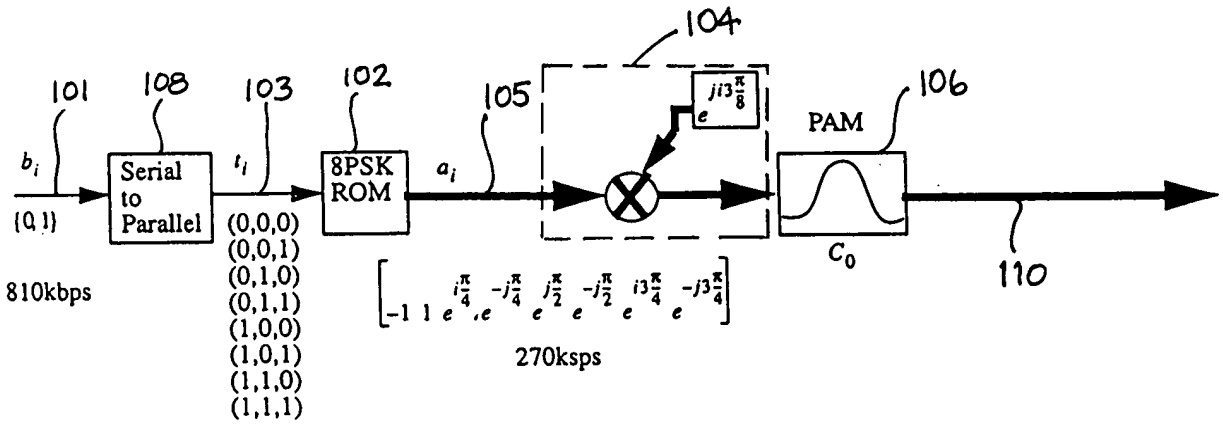
104
101
108
103
102
105
106
b_i
{0,1}
Serial to Parallel
t_i
(0,0,0)
(0,0,1)
(0,1,0)
(0,1,1)
(1,0,0)
(1,0,1)
(1,1,0)
(1,1,1)
8PSK ROM
a_i
$e^{ji3\frac{\pi}{8}}$
PAM
C_0
110
810kbps
$\begin{bmatrix} -1 & 1 & e^{i\frac{\pi}{4}} & e^{-j\frac{\pi}{4}} & e^{j\frac{\pi}{2}} & e^{-j\frac{\pi}{2}} & e^{i3\frac{\pi}{4}} & e^{-j3\frac{\pi}{4}} \end{bmatrix}$
270ksps

FIG. 1A

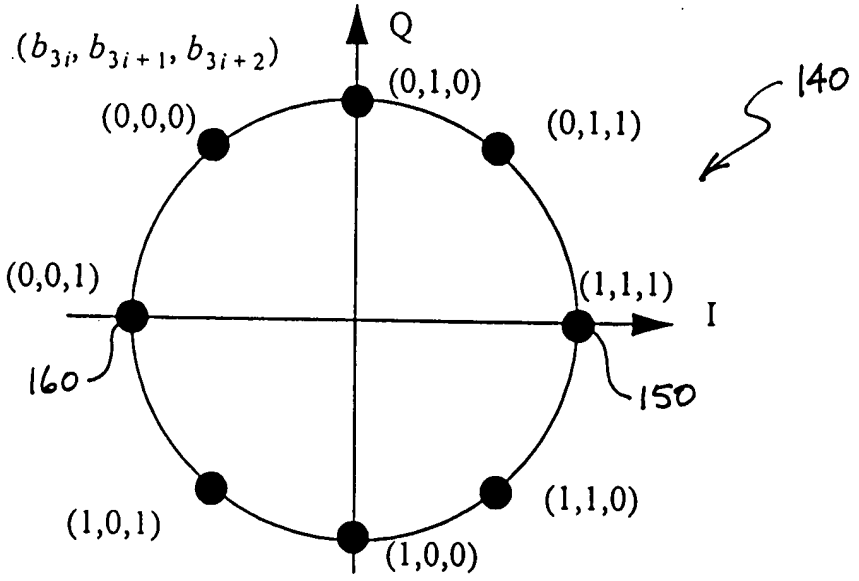
$(b_{3i}, b_{3i+1}, b_{3i+2})$
Q
I
140
(0,1,0)
(0,0,0)
(0,1,1)
(0,0,1)
(1,1,1)
160
150
(1,0,1)
(1,1,0)
(1,0,0)

FIG. 1B

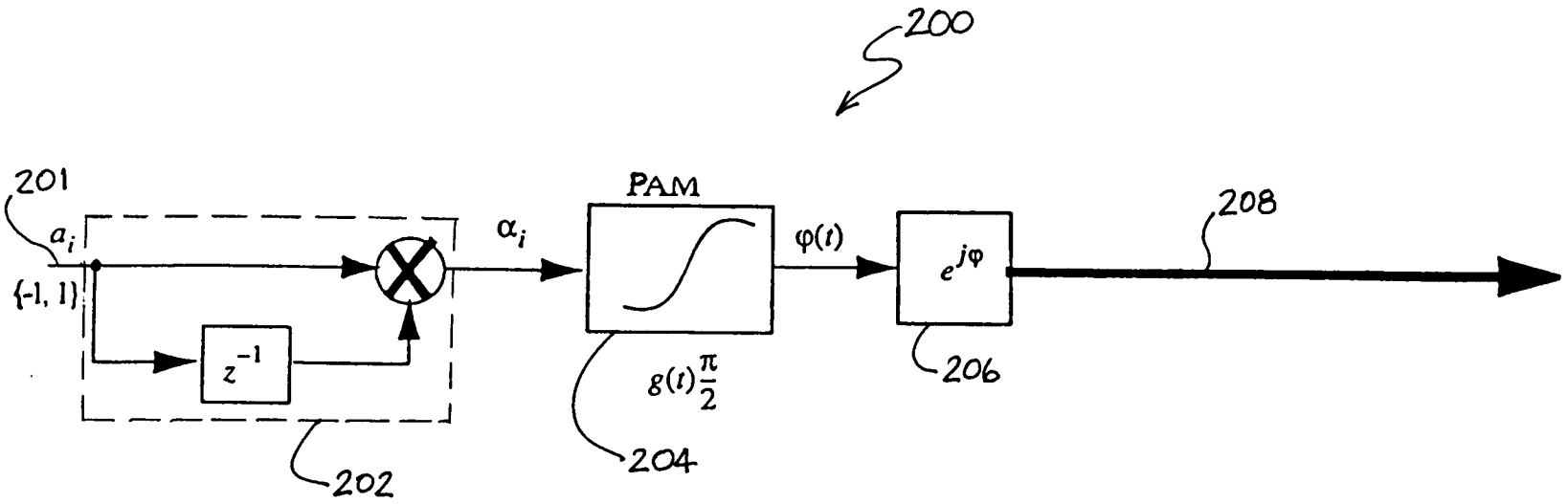
200
201
a_i
{-1, 1}
z^{-1}
202
α_i
PAM
$g(t)\frac{\pi}{2}$
204
$\varphi(t)$
$e^{j\varphi}$
206
208

FIG. 2A

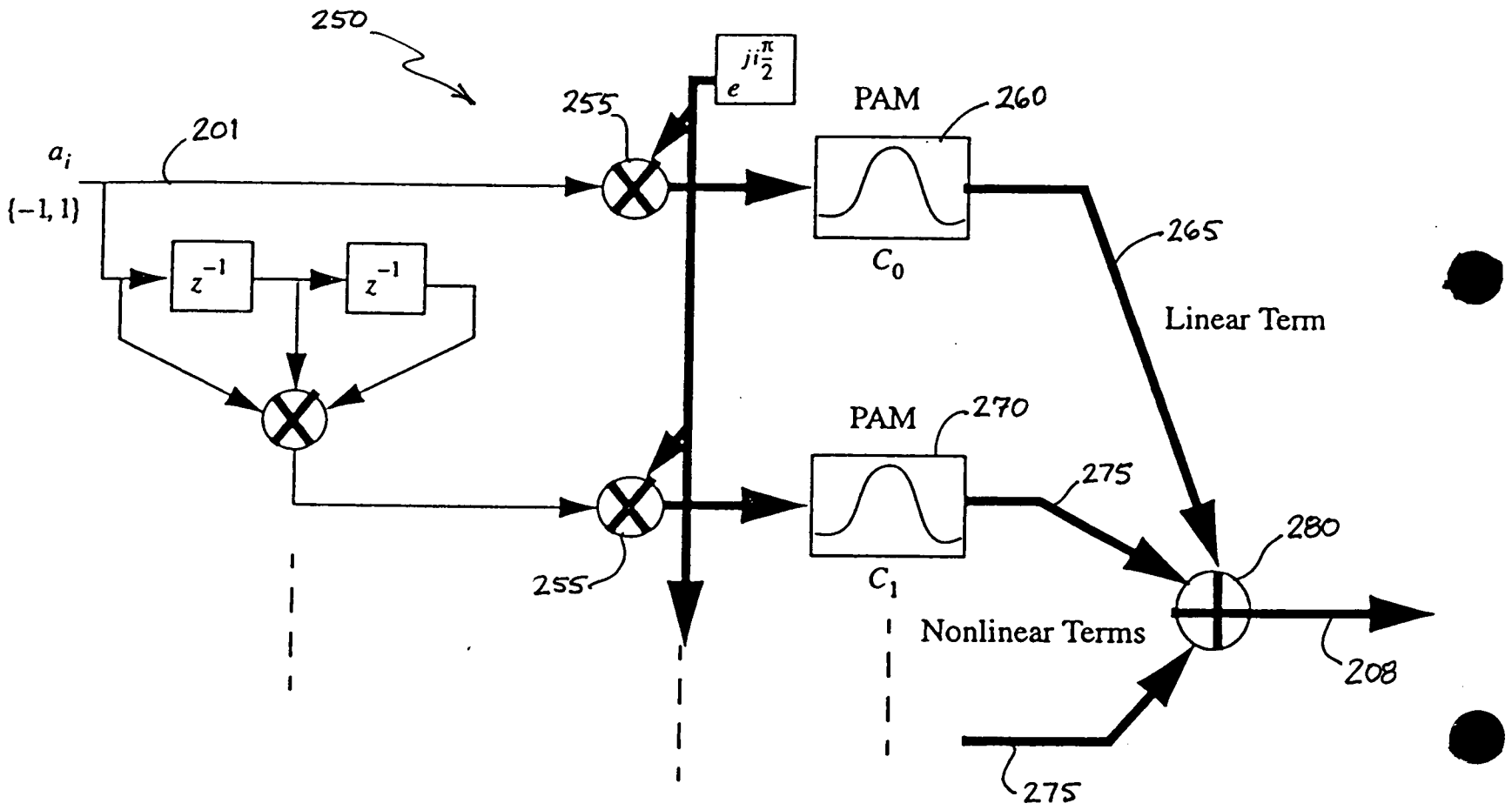
250
201
a_i
{-1, 1}
z^{-1}
z^{-1}
255
255
$ji\frac{\pi}{2}$
e
PAM
260
C_0
265
Linear Term
PAM
270
C_1
275
280
Nonlinear Terms
208
275

FIG. 2B

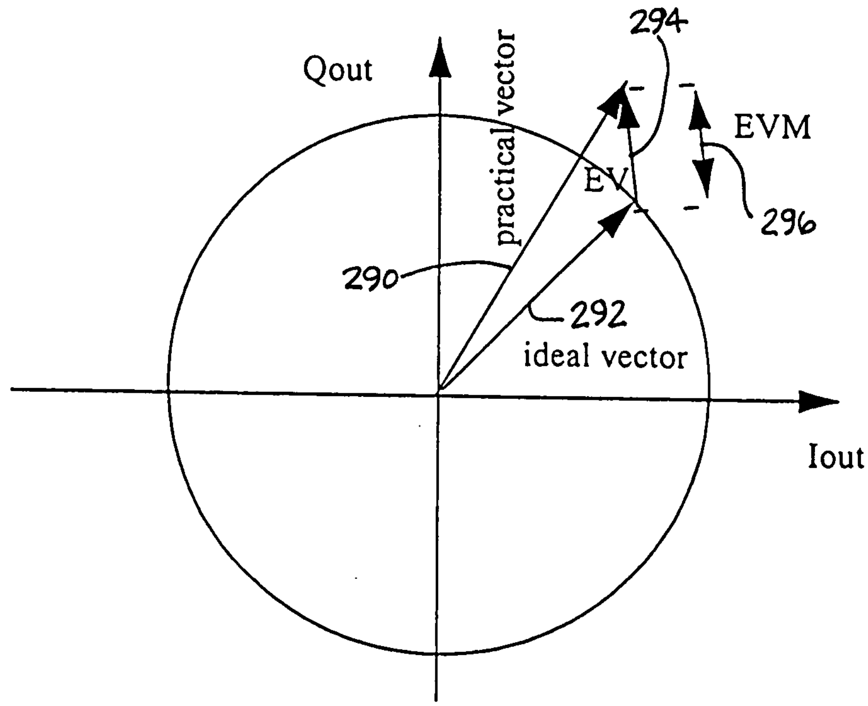

FIG. 2C

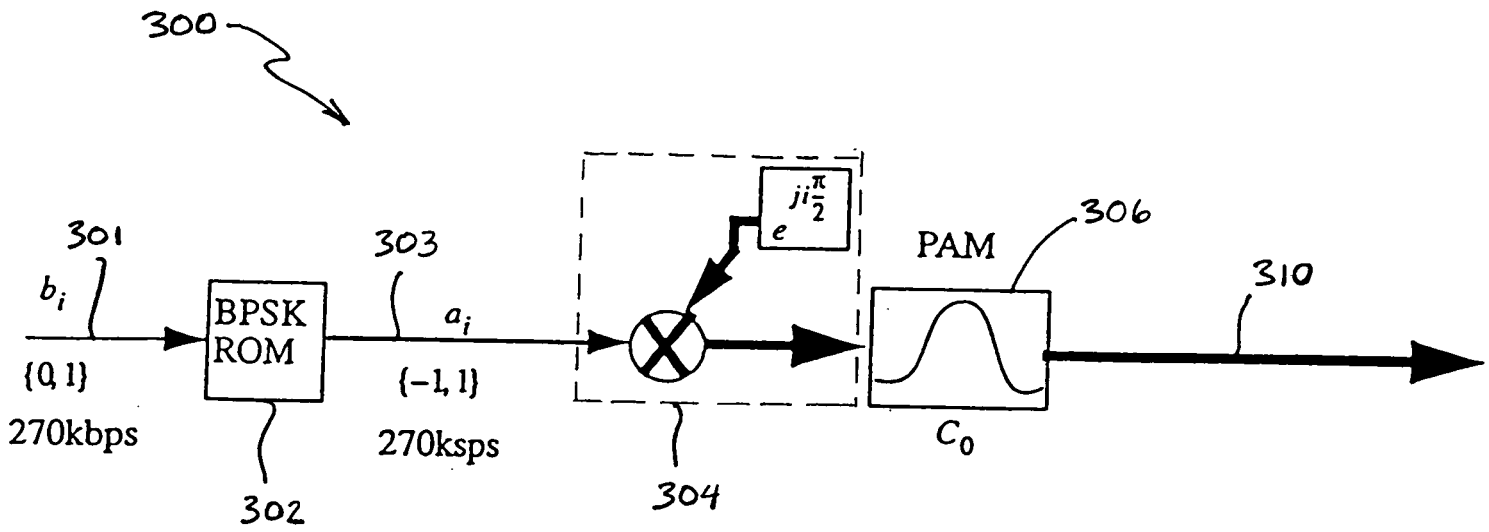
300
301
b_i
{0, 1}
270kbps
BPSK
ROM
302
303
a_i
{−1, 1}
270ksps
304
$e^{ji\frac{\pi}{2}}$
PAM
306
C_0
310

FIG. 3

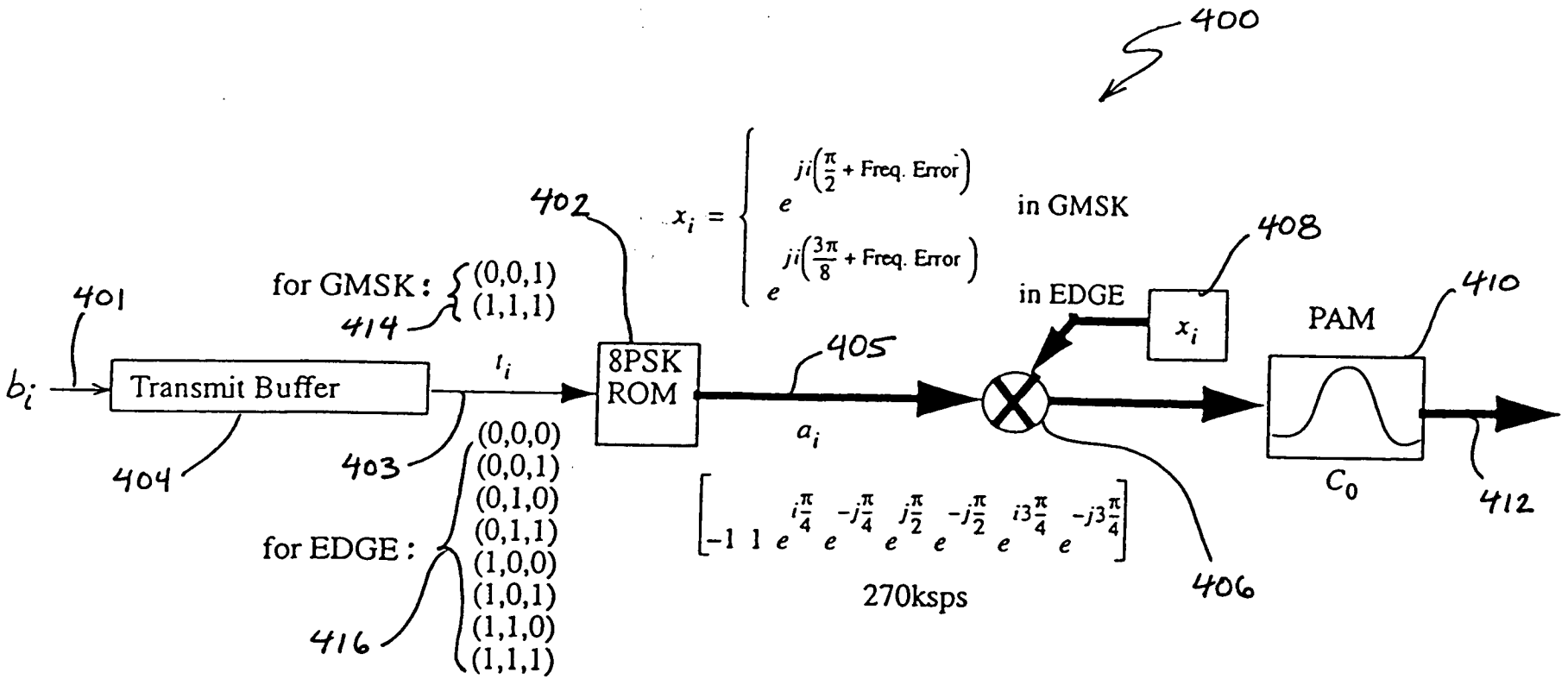
400
402
$x_i = \begin{cases} e^{ji\left(\frac{\pi}{2} + \text{Freq. Error}\right)} & \text{in GMSK} \\ e^{ji\left(\frac{3\pi}{8} + \text{Freq. Error}\right)} & \text{in EDGE} \end{cases}$
408
410
401
for GMSK : (0,0,1) (1,1,1)
414
PAM
x_i
b_i
Transmit Buffer
t_i
8PSK ROM
405
a_i
404
403
(0,0,0) (0,0,1) (0,1,0) (0,1,1) (1,0,0) (1,0,1) (1,1,0) (1,1,1)
for EDGE :
416
$\begin{bmatrix} -1 & 1 & e^{i\frac{\pi}{4}} & e^{-j\frac{\pi}{4}} & e^{j\frac{\pi}{2}} & e^{-j\frac{\pi}{2}} & e^{i3\frac{\pi}{4}} & e^{-j3\frac{\pi}{4}} \end{bmatrix}$
270ksps
406
C_0
412

FIG. 4

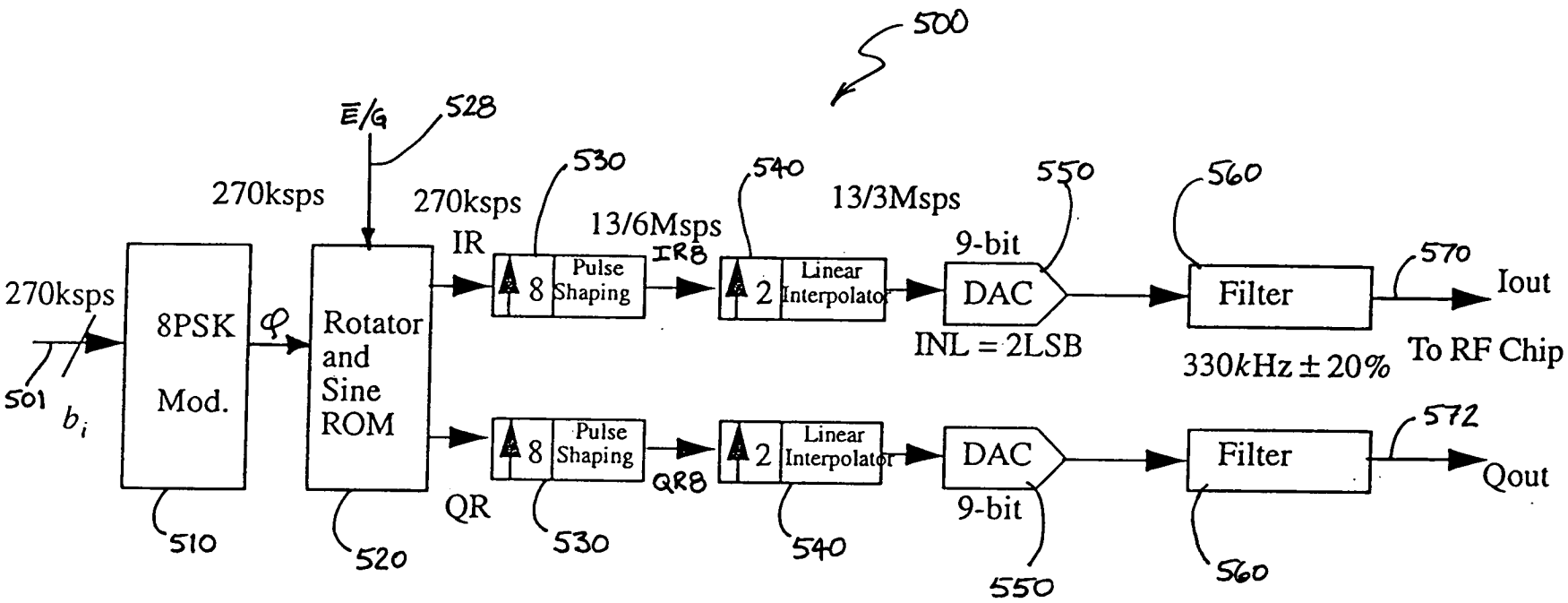
500
E/G
528
270ksps
270ksps
IR
530
13/6Msps
IR8
540
13/3Msps
550
9-bit
560
570
Iout
270ksps
8PSK
Mod.
φ
Rotator
and
Sine
ROM
8
Pulse
Shaping
2
Linear
Interpolator
DAC
Filter
INL = 2LSB
330kHz ± 20%
To RF Chip
501
b_i
510
520
QR
530
QR8
540
550
572
Qout
560

FIG. 5A

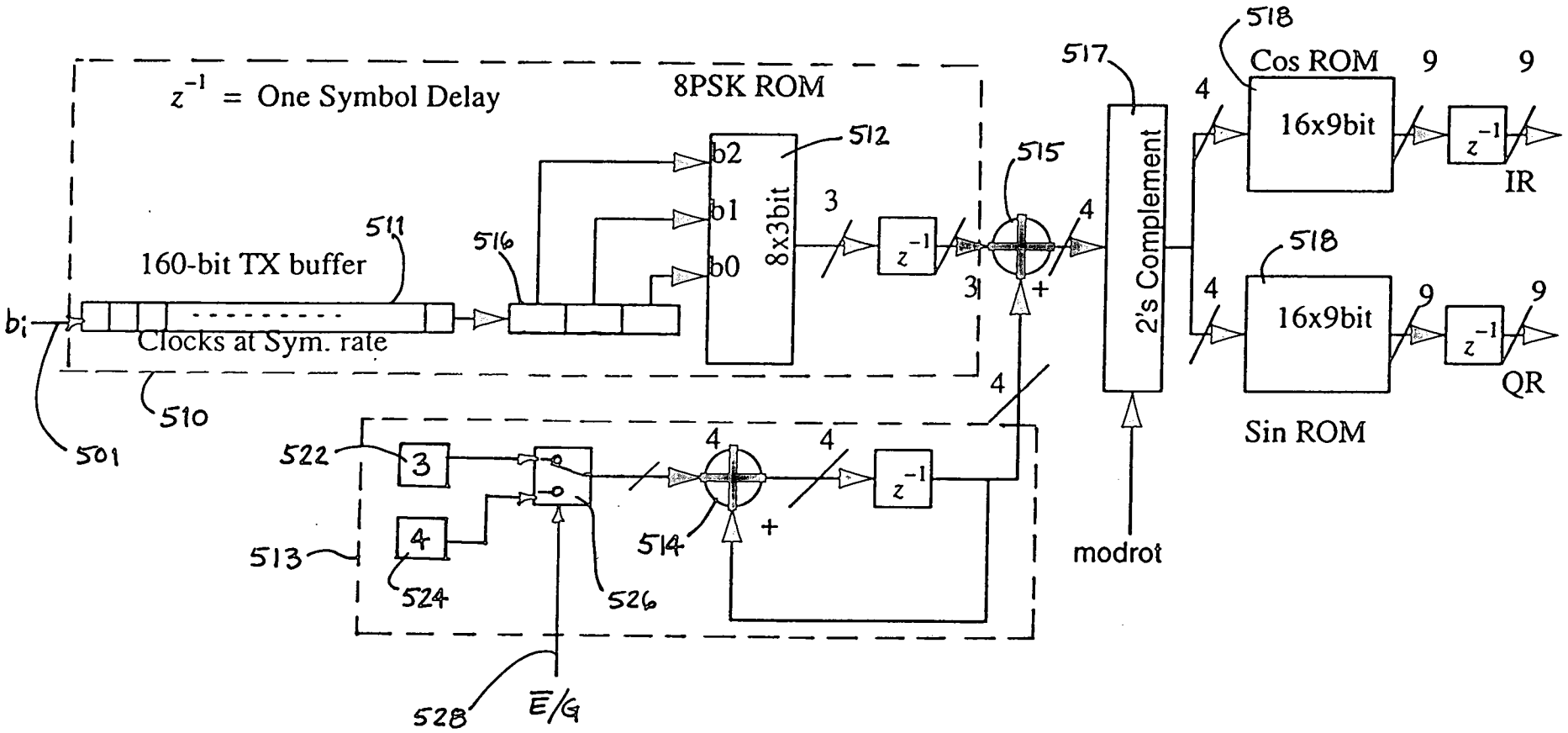
z^{-1} = One Symbol Delay
8PSK ROM
160-bit TX buffer
Clocks at Sym. rate
bi
501
510
511
516
512
b2
b1
b0
8x3bit
3
515
517
2's Complement
518
Cos ROM
16x9bit
IR
Sin ROM
QR
modrot
522
513
524
526
514
528
E/G

FIG. 5B

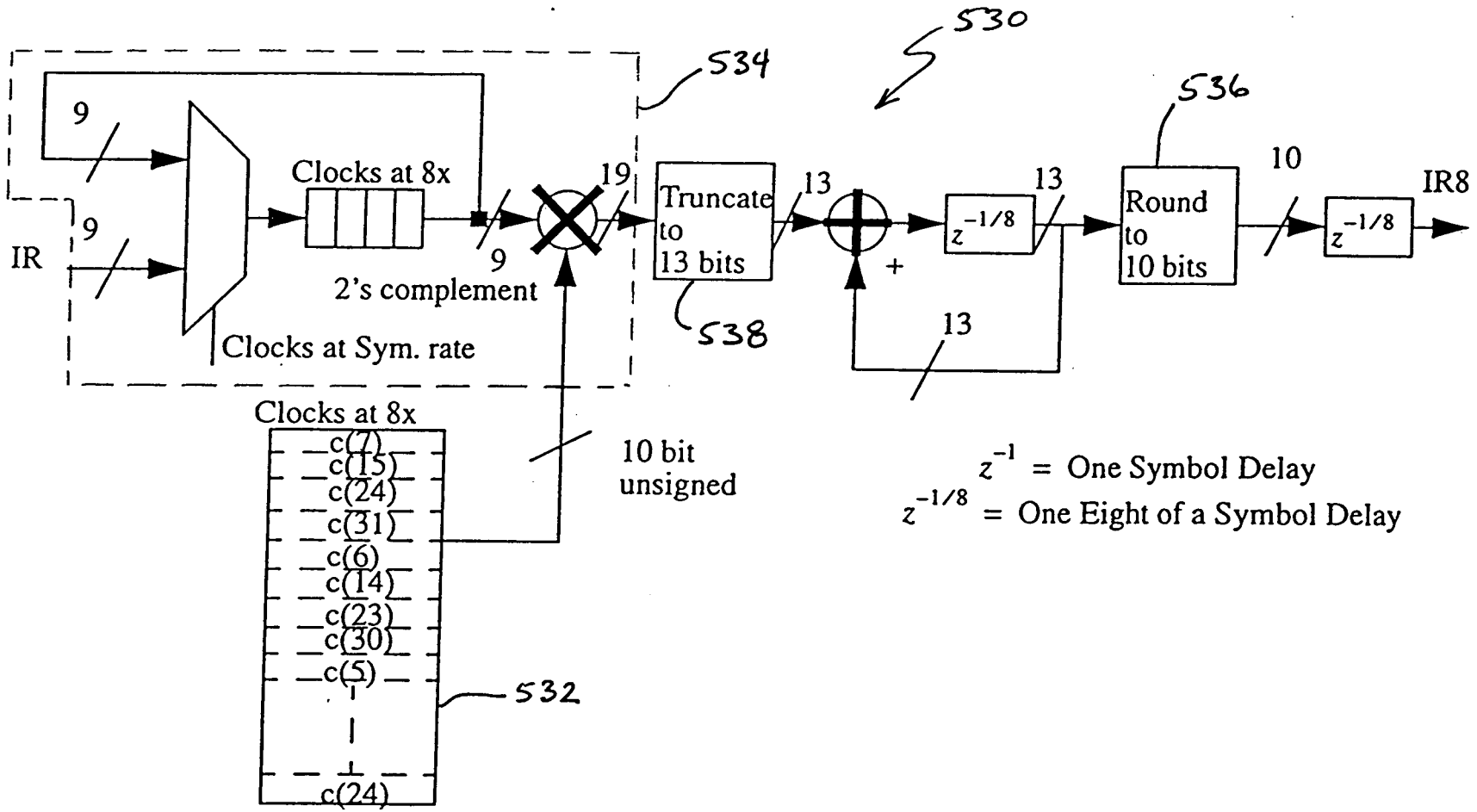
530
534
536
538
532
9
9
IR
Clocks at 8x
19
9
2's complement
Clocks at Sym. rate
Truncate
to
13 bits
13
13
13
+
Round
to
10 bits
10
IR8
Clocks at 8x
c(7)
c(15)
c(24)
c(31)
c(6)
c(14)
c(23)
c(30)
c(5)
c(24)
10 bit
unsigned
z^{-1} = One Symbol Delay
$z^{-1/8}$ = One Eight of a Symbol Delay

FIG. 5C

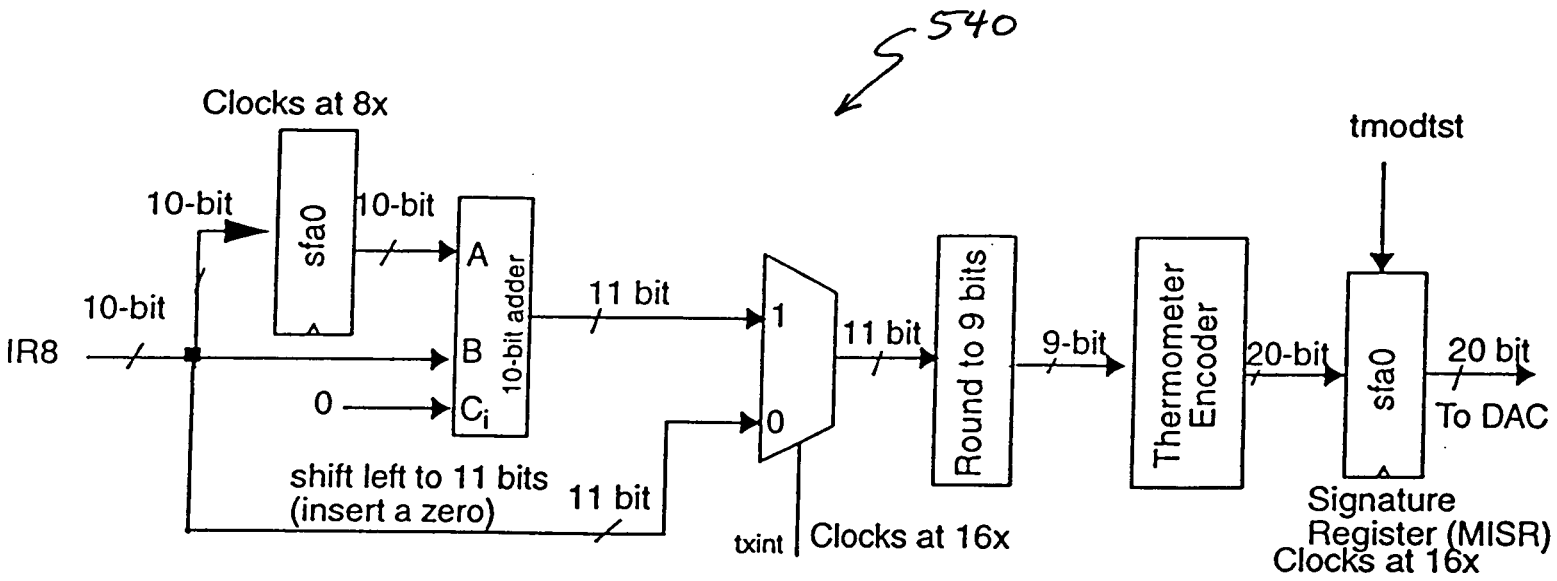
540
Clocks at 8x
10-bit
sfa0
10-bit
A
10-bit adder
10-bit
IR8
B
11 bit
1
11 bit
Round to 9 bits
9-bit
Thermometer Encoder
20-bit
sfa0
20 bit
To DAC
tmodtst
0
C_i
0
shift left to 11 bits
(insert a zero)
11 bit
txint
Clocks at 16x
Signature Register (MISR)
Clocks at 16x

FIG. 5D

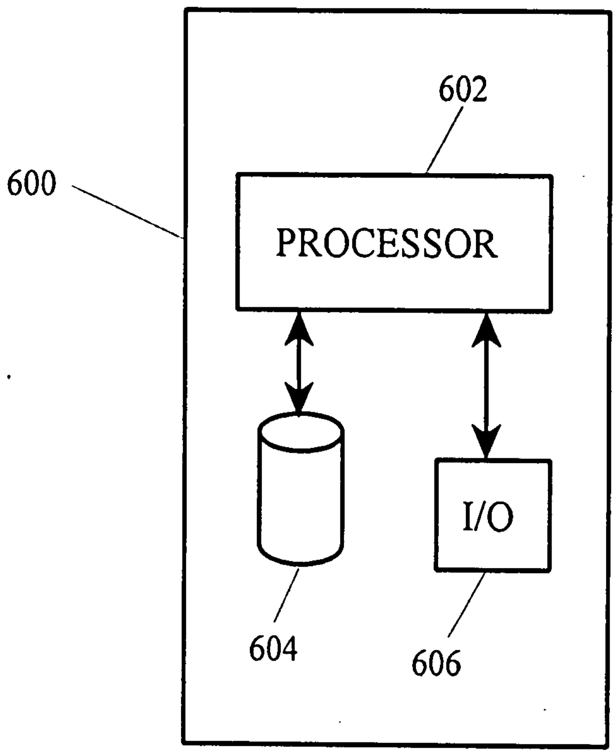

FIG. 6